SUSTAINABLE IMPACTS FOR A SEAMLESS TRANSITION IN THE U.S. VEGETABLE INDUSTRY

John J. VanSickle*, Charlene Brewster and Thomas H. Spreen
University of Florida

Methyl bromide is a broad spectrum pesticide that has been identified as critical for the production and marketing of many fruit and vegetable crops. Spreen et al. (1995) estimated that the loss of methyl bromide would have a $1 billion impact on the winter U.S. vegetable industry, with Florida accounting for nearly all of this impact. UNEP (1997) indicated that research and development could have significant effects in reducing the impact of a methyl bromide ban.

A model of the North American vegetable market was developed to estimate the impacts of a ban of methyl bromide on producers and consumers of fresh vegetables in North America. The model expands the work completed by Spreen et al. (1995), converting that model from a winter model to a full year model. Florida and California stand to suffer similar total losses when a ban on methyl bromide is imposed if better alternatives are not developed than are known today. Florida shippers stand to lose $218.4 million in shipping point revenues across all crops while California shippers stand to lose $218.1 million, mostly attributable to strawberries. Mexico will gain from the loss of methyl bromide because of their lower reliance on it as a pesticide and because Mexican producers will have an additional 10 years to use methyl bromide under the Montreal Protocol. Mexican shippers will gain $134.9 million. Texas will also gain $33.3 million in shipping point revenues since peppers grown by their producers do not rely on methyl bromide. South Carolina also gains $9.4 million from increased shipping point revenues for tomatoes. Losses in consumers' surplus were also measured in the model. Consumer surplus is lost from a decline in the quantity of products consumed and an increase in the prices paid. Consumer surplus is expected to decline $111.68 million dollars.

A relevant question remaining is ‘What targets for methyl bromide alternatives must be met to experience a seamless transition for existing producers?’ That question was explored by determining the sustainable impacts on preharvest costs and yield that would result in a seamless transition for producers. It was assumed that a seamless transition is experienced when market shares after adopting alternatives are within 10 percent of the baseline market shares.

The results indicate that the challenges facing the scientific community in developing better alternatives are significant. To experience a seamless transition for tomato production with cost penalties the same as for existing alternatives, yield impacts would have to be reduced from 20 percent for tomatoes grown in Dade County, Florida to only 9 percent. This represents a 55 percent reduction in yield loss for currently identified next best alternatives. Yield losses in other producing areas of Florida would have to decline 60 percent, from the 10 percent expected yield impact to only 4 percent.

The challenge to keep Florida producers competitive in pepper production is even greater. Current estimates indicate that using a Telone C17/ Devrinol herbicide combination for bell pepper production in Florida will reduce yields 15 percent. Those impacts need to be reduced to 1 percent before Florida can experience a seamless transition for pepper production.

The challenge to developing alternatives for double cropping systems is also significant. Current estimates for cucumbers, squash and watermelons grown as second crops to tomatoes and bell peppers indicate a 15 percent reduction in yields for these second crops. Those yield impacts must be reduced to 3 percent before a seamless transition is experienced by producers using double cropping systems in Florida.

The challenge to developing better alternatives is also important to strawberry producers. Current estimates indicate that a switch to Telone C17/Devrinol herbicide combination in Florida will result in a 15 percent decline in expected yields. Yields in California are expected to decline 20 percent when Chloropicrin is used as an alternative to methyl bromide. The model indicates that a seamless transition is impossible for strawberry production since expected increases in preharvest costs in California ($653 per acre) with no yield impact will result in California losing more than 10 percent of its existing market share.

The model was also evaluated to determine the yield impacts that were sustainable if alternatives are developed with no change in preharvest costs. The results indicate that vegetable producers could sustain only 20 percent of the currently estimated impacts on yield before causing significant changes in market share that deny a seamless transition. A seamless transition in strawberry production will require that these yield reductions be lowered to only 5 percent for California and Florida in order for California producers to experience a seamless transition.

The model was also used to determine how much growers could increase preharvest costs with no impact on yields in order to experience a seamless transition. The results indicate that growers of vegetables could experience a preharvest cost increase of only 3.5 percent before impacts on market share were larger than that allowable for a seamless transition. Preharvest costs could increase by only 5 percent for strawberries for producers in California to experience a seamless transition.

These results indicate that the challenge is significant in attempting to mitigate the impact a ban on methyl bromide will have on U.S. growers of fresh vegetables and strawberries. New technologies that reduce yield impacts and control costs must be significant to mitigate these impacts.

Spreen, T. H., J. J. VanSickle, A. E. Moseley, M.S. Deepak, and L. Mathers. “Use of Methyl Bromide and the Economic Impact of its Proposed Ban on the Florida Fresh Fruit and Vegetable Industry.” Univ. Flor. Tech. Bull. 898. 1995.

United Nations Environmental Programme (UNEP). 1997 Report on the Economic Viability of Methyl Bromide Alternatives. 1997.